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From Collapse to Stability: Rebuilding Iran's Pension

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March 20, 2025

INTRODUCTION

Pension spending is often the largest component of government budgets all around the world. In light of falling birth rates and rising life expectancy, many countries have been forced to reform their pensions to adjust to the new reality. Iran's pension system is no exception when it comes to the enormity of the challenges lying ahead, especially given that it has one of the fastest aging populations in the world [1]. Pension policy also affects a range of other important outcomes, including a nation's savings rate, labor supply, and fertility rate. The existing pension system in Iran suffers from massive unfunded liabilities, low coverage, poor governance, and high rates of early retirement. Regime change will offer policymakers an opportunity to fix these issues.

Our vision for pension reform in Iran involves a gradual shift from the current defined-benefit, pay-as-you-go (DB-PAYG) scheme to a funded, defined-contribution (FDC) system featuring mandatory (or auto-enroll with opt-out) individual contributions coupled with a matching contribution from the government that will be financed by the country's vast hydrocarbon wealth. The contributions will be kept in mandatory individual retirement accounts (MIRAs)[1] and invested primarily in low-cost index funds holding a wide variety of globally diversified financial assets. Reputable international asset managers such as Vanguard, Blackrock, and others could be tasked with managing those investments, and account holders will have the option of choosing among a limited number of competing funds that meet strict investor-protection criteria. As a default option, the investments will be fully or partially annuitized upon retirement to protect pensioners against longevity risk and provide them with a steady source of income. Contributions to MIRAs and post-retirement withdrawals from them will be tax free, but early withdrawals will be subject to taxes and/or penalties. The government will also provide a flat contribution to every individual conditional on their own participation in the scheme. This will especially help workers whose lifetime earnings alone are not high enough to secure a poverty-free retirement. If government MIRA contributions over an individual's working life are ultimately insufficient to push their pension income/assets above the poverty line, additional aid will be provided from general government revenues to those pensioners who contributed to MIRAs and/or the legacy pension system for a minimum number of years. The model we propose has similarities to the pension systems of Australia, Chile, Denmark, Israel, Iceland, Mexico, the UK, and Singapore, but is further tailored to the specific circumstances of a resource-rich country like Iran.

We will start this chapter by discussing the basic objectives of pension design (Section 2) and the current state of Iran's pension system (Section 3). We will then provide a comparison of pension systems around the world (Section 4) and use it as a basis to propose our ideal system for Iran (Section 5). Finally, we will detail the transition process from the current state to our proposed model (Section 6).

1. BASIC OBJECTIVES OF PENSION DESIGN

Pension systems typically pursue a combination of three objectives [3]:

1. **CONSUMPTION SMOOTHING** refers to the desire of individuals to transfer consumption from their younger, working years to their older, non-working years in order to experience a smoother consumption trajectory that results in higher lifetime utility. The degree to which a pension plan provides consumption smoothing is captured by its replacement rate, which is defined as the ratio of pension benefits to previous earnings [3, 4]. On average, the replacement rate for full-career average-wage workers in the OECD is 61% [5]. By contrast, the average replacement rate in Iran is 83% [6].

2. **INSURANCE**: If individuals were certain about how long they were going to live, they would just save an adequate amount during their working years to provide for their retirement. In reality, however, people face the risk of outliving their retirement savings (i.e., longevity risk). This is where the insurance component of pensions comes into the picture [3]. While individuals can minimize longevity risk by saving a lot during their working lives, this would necessarily come at the expense of a reduced

[1] We borrow this term from Feldstein and Samwick [2].

pre-retirement standard of living_ a sacrifice that might eventually prove pointless. Annuities solve this problem by pooling longevity risk over large groups of retirees [3]. An annuity offers an individual a guaranteed stream of payments for the rest of his life in exchange for his retirement savings. Annuitization also protects retirees against market risk by shielding them from market fluctuations.

3. **POVERTY RELIEF:** Old-age poverty relief is meant for individuals who are either too myopic or too poor on a lifetime basis to save enough for retirement [3]. The problem of myopia is typically addressed by making pension contributions mandatory. On top of that, pension systems often engage in redistribution by offering low earners a higher replacement rate than high earners. For example, across the OECD, workers earning half the average wage have a mean replacement rate of 73% [5]. The safety-net component of pension systems is sometimes referred to as a "first-tier" or "first-pillar" pension, while the second and third tiers serve the objective of consumption smoothing [5]. In practice, many real-world systems provide a level of redistribution that goes beyond addressing absolute poverty and functions as a complement to progressive taxation [3]. Redistribution can be both within and between generations.

The different objectives of a pension system can sometimes come into conflict with each other. For example, in a system that exclusively focuses on consumption smoothing, the benefits bear a fairly exact relationship to a worker's cumulative contributions; but such a system would fail to protect low-paid workers against old-age poverty [3].

2. THE CURRENT STATE OF PENSIONS IN IRAN

2.1. Overview

Iran's pensions are mostly defined-benefit, pay-as-you-go (DB-PAYG) [7], meaning that pensioners receive a fixed level of benefits that are financed by contributions from current workers (see Section 4.1 for a more detailed explanation of those terms) [3]. In total, there are 17 pension funds covering about 73% of the population [8–9]. The four largest funds, which are the Social Security Organization (SSO), the Civil Servants Pension Fund (CSPF), the Rural and Nomads' Pension Fund (RNPF), and the Armed Forces Pension Fund (AFPF), are supervised by the Ministry of Cooperatives, Labor, and Social Welfare (MCLSW) [7]. The other thirteen are occupational and industry-specific funds (e.g., for employees of the oil industry, commercial banks, the steel industry, the copper industry, the public broadcasting organization, Tehran's municipality, and the Ministry of Intelligence) [7]. The biggest pension provider is SSO which is open to all employees of the private sector who do not have their own industry-specific pensions, as well as the self-employed (who can contribute voluntarily) [7, 10]. Table 1 shows that SSO, CSPF, AFPF, and RNPF respectively covered 54%, 7%, 4%, and 7% of the population as of 2021, while industry-specific funds as a whole covered only 2% [8]. The contribution rates for SSO are 7% from the employee, 20% from the employer, and 3% from the government, out of which 5%, 14%, and 2% go towards pensions, respectively [10].[2] For CSPF and AFPF, the employee contributes 9% while the employer (i.e., the government) contributes 13.5% [7].[3] These contribution rates are among the highest in the MENA (Middle East & Northern Africa) region, and there are concerns that they might encourage informal employment and crowd out other forms of savings that could contribute to the development of financial markets [11–12]. The primary reasons behind the coverage rate not being higher than it is are the high rates of youth unemployment and informal employment, in addition to the low rate of labor force participation by women [7].

[2] SSO also provides health, unemployment, and disability insurance. See the chapter on healthcare for our plans to reform the health insurance function of the organization. Unemployment insurance is financed by a separate 3% contribution from the employer [12].
[3] However, the government is also responsible for covering any deficits that may arise [7].

	Fund	Population Coverage	Replacement Rate	Support Ratio
	Social Security Organization (SSO)	53.6%	83%	4.2
	Civil Servants Pension Fund (CSPF)	6.9%	99%	0.5
	Armed Forces Pension Fund (AFPF)	3.7%	98%	0.8
	Rural and Nomads' Pension Fund (RNPF)	6.8%	65%	9.6
	Occupational Funds	1.9%	90%	1.1

TABLE 1: Population coverage, replacement rates, and support ratios of Iranian pensions funds [8 , 23].

Until recently, the official retirement age was 60 for men and 55 for women with at least 20 years of contributions, 50 for men or 45 for women with at least 30 years of contributions, or at any age with at least 35 years of contributions [10, 13–15].[4] The statutory retirement ages are associated with the peaks in Figure 1. However, the system's growing unfunded liabilities forced the government to raise the official retirement age for men (but not women) to 62 in 2023 [16].[5] By comparison, the average normal retirement age across OECD countries in 2022 was 64.4 for men and 63.6 for women [5].[6] The various provisions allowing for early retirement in Iranian law reduce the effective retirement age even further [14–15]: On average, Iranian men and women, who have life expectancies of about 76 and 80 years (see Figure 5), retire at the ages of 52 and 50, respectively [17]. About 52 percent of SSO pensioners retire early [18].
By contrast, the average effective retirement age across OECD countries in 2022 was 64.4 for men (in other words, no different than the statutory age) and 63.1 for women [5].

[4] People working in unhealthy or physically demanding environments could retire at any age with at least 20 years of consecutive or 25 years of nonconsecutive employment [13].
[5] There was also an extension of the employment duration required to qualify for a full pension. For example, new entrants into the workforce will have to work for 42 years to qualify [16]. However, those reforms alone will not be sufficient to restore financial stability to the system [6].
[6] The highest is 67 in Denmark, Iceland, Norway, and Israel (men only) [5].

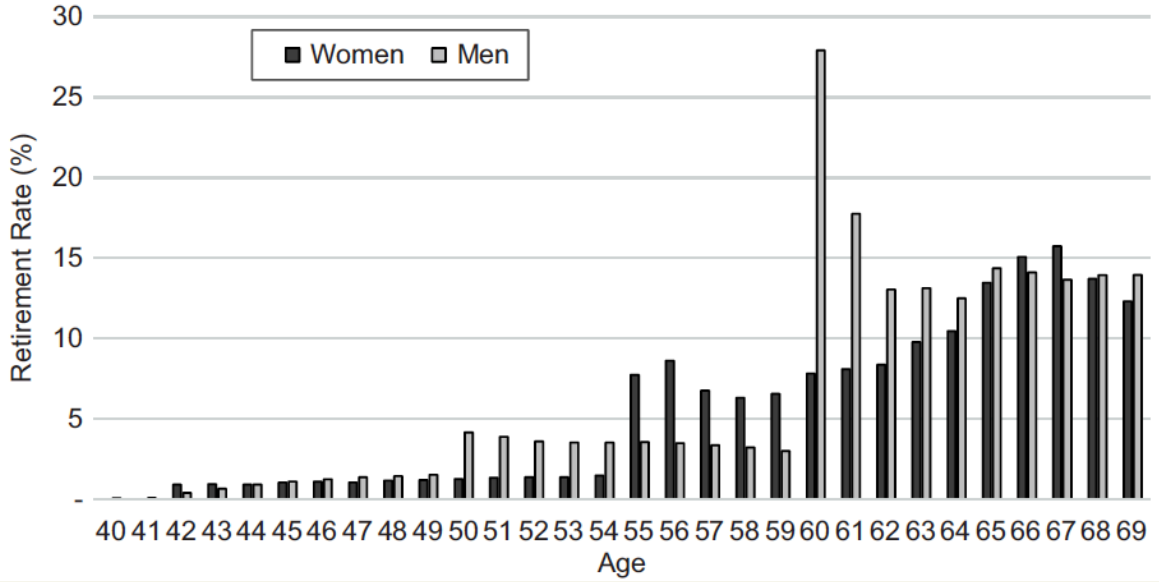

FIGURE 1: The retirement rate of SSO's contributors in 2016 by age, adopted from Sadati, et al. (2024) [14].

There are additional factors besides a low statutory retirement age that make the Iranian pension system overly generous by international comparison. The benefit-calculation formula currently used by all Iranian pension funds is [10]:

Pension = (1/30) × (Years of Contributions) × (Average Earnings over the Last 2 Years of Contributions),

where the coefficient 1/30 ≅ 3.3% is commonly referred to as the accrual rate (i.e., the pension amount increases by about 3.3% for each additional year of contributions). This accrual rate (which results in a 100% replacement rate after 30 years of service) is much higher than the 1.5%–2.5% used in other MENA countries [7] and OECD's average of 1.34% [5]. This has resulted in very high replacement rates (see Table 1) averaging around 83% [6], compared to the OECD average of 61% [5]. Net replacement rates can sometimes exceed 100% due to the tax exemption enjoyed by pensioners [7]. These high replacement rates are themselves another factor behind the high take-up of early retirement [14].

Additionally, the inclusion of only the last two years of earnings in the benefit formula results in manipulation while also discouraging effort by the younger workers [3]. One example of such manipulation is a tacit agreement between the employer and the employee to under-report the employee's earnings over most of his/her working life so that both of them pay less in SSO contributions, followed by accurate reporting and possibly a raise in the last two years so that the employee is entitled to a more generous pension [19]. This is yet another factor behind the system's deteriorating fiscal position.

2.2. Governance

The governance structure of Iran's pension funds is one of the factors behind their poor performance [12]. In this section, we will mostly focus on the SSO as the largest of the funds. Figure 2 shows the organizational chart of the SSO and how it has evolved in recent years.

Until 2010, the High Council for Social Security was in charge of appointing the SSO's Board of Directors [12, 19–20]. The High Council was a "tripartite" governance body in the sense that it consisted of government representatives, employer representatives, and worker representatives [12, 19–20]. International experience suggests that tripartism does not generally result in prudent management as tripartite bodies usually end up composed of individuals without the relevant technical expertise or the independence to pursue the best interests of plan members [12]. The abolition of the High Council under the presidency of Mahmoud Ahmadinejad further weakened the SSO's independence as the government gained full control over the Board's composition through the MCLSW [20–21]. The independence of the Supervision Committee was also significantly weakened [12, 20–21]. One particularly negative manifestation of the SSO Board's lack of independence has been its acceptance of often unprofitable public companies in lieu of payments on the government's debt to the SSO [9, 11–12, 19].[7] About 80% of SSO's investments are currently comprised of companies that it received from the government in lieu of debt payments [9]. At the same time, close to half of the profits on SSO's investments come from the other 20% of its portfolio, which indicates the low quality of the assets transferred to it by the government [9]. All in all, it should be no surprise that the real rate of return (RoR) on SSO's investments has been variously estimated at +1.4% [6], –5.5% [9], and +0.3% [11] per year.

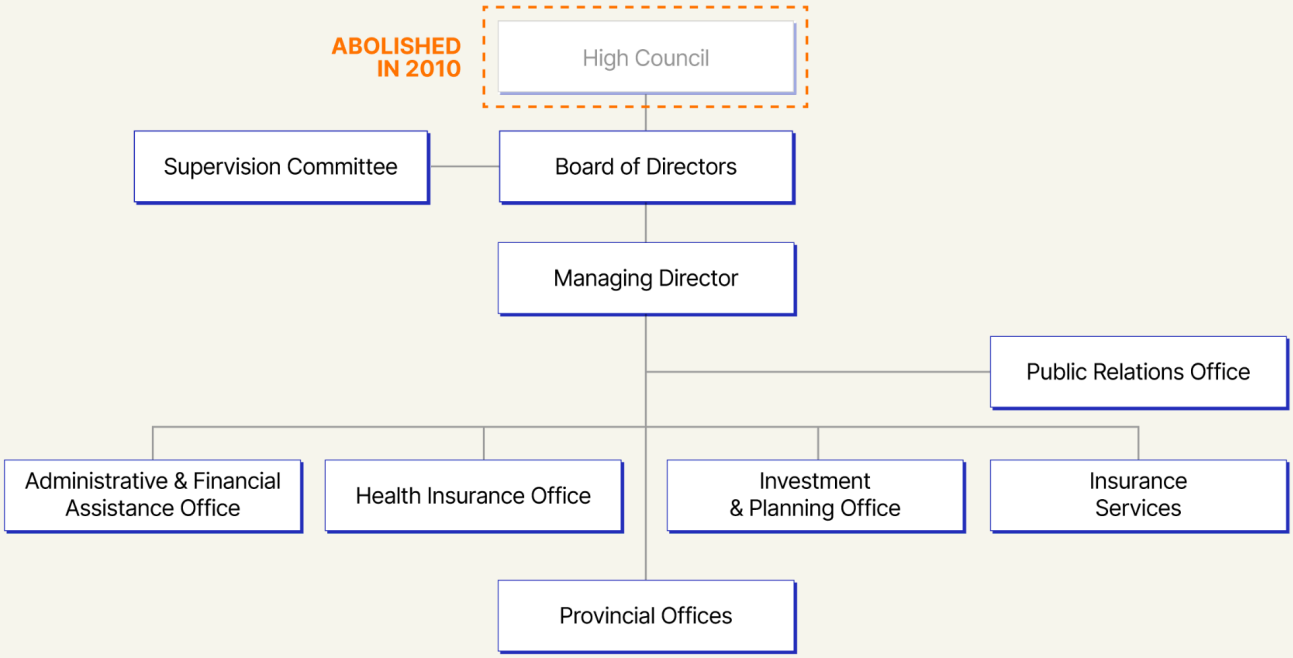

FIGURE 2: Organizational chart of the SSO, reproduced from the 2003 World Bank study [12] (with minor modification to reflect more recent developments [19 – 21]).

[7] The primary source of this debt is the government's failure to make its 3% contribution to the SSO [9, 11, 19].

2.3. Current and Long-Term Fiscal Position

The issues discussed in Sections 3.1 and 3.2 have pushed Iran's pension funds to insolvency [8, 12, 22]. Two of the funds, namely, the government-run CSPF and AFPF, are already illiquid [22]: Their support ratios (i.e., the ratio of contributors to pensioners) are respectively 0.5 and 0.8 (see Table 1), and about 90% of their funding comes from the government [23]. The two schemes collectively consumed a whopping 62% of the government's social welfare budget as of 2023 [18]. Conditions are somewhat better for the SSO, where the support ratio is currently 4.2 and retirement contributions pay for about 86% of pensions [23].[8] SSO's investments pay for another 6% [23], making it a "partially funded" system (see Section 3.2 on the performance of those investments and Section 4.1 for a more general discussion on the degrees of funding),[9] and the remaining 8% comes from a combination of loans from the banking system and government transfers. While those numbers imply that SSO is still liquid, it is nevertheless insolvent when considering its growing unfunded obligations in the long run [22] that are driven by Iran's aging demographics (see Figure 3 and Figure 4). The unfunded liabilities of SSO and CSPF over a 60-year horizon have net present values equaling 220% and 187% of Iran's current GDP, respectively [8]. Total government assistance to pension funds as a share of the government's overall budget is now at 16% [24], but the funding deficit of SSO alone will reach over 15% of Iran's GDP (or greater than the government's total budget!) by 2055 and 50% of the GDP by 2090 based on calculations performed by the Parliament Research Center [9, 15][10]

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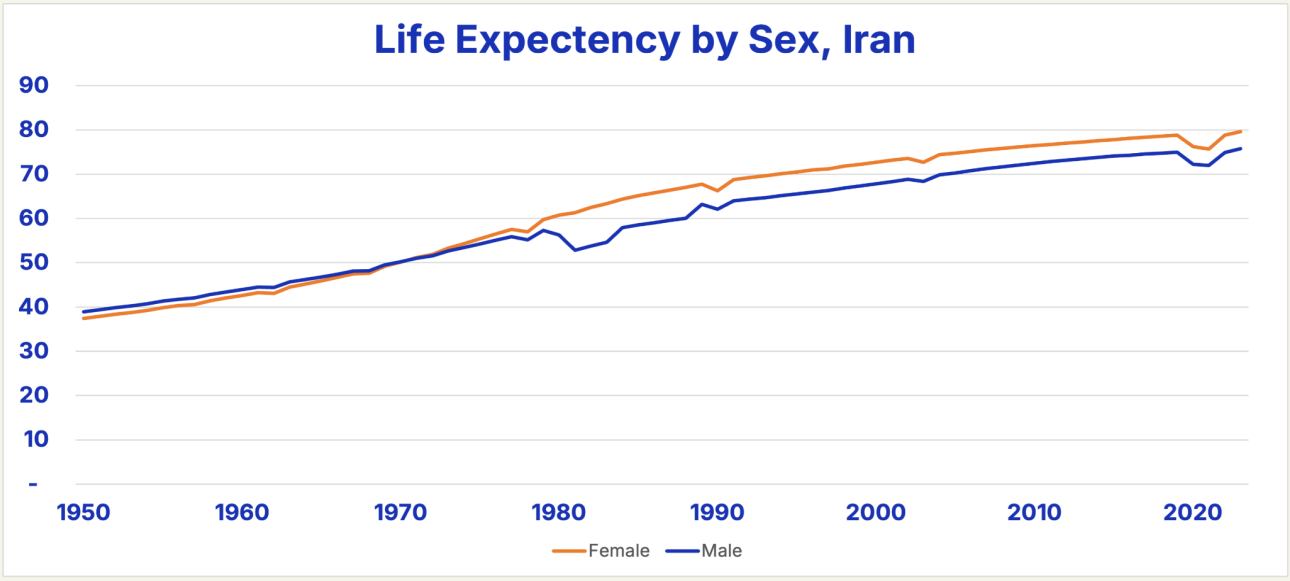
[8] A healthy support ratio is generally considered to be 5–7 [8].

[9] CSPF is also partially funded, with profits on investments accounting for 9%–14% of its total resources [9].

[10] The IMF's projections are somewhat more optimistic but still troubling: total pension deficit will reach 11% of the GDP by 2050 and 15% by 2080 [22].



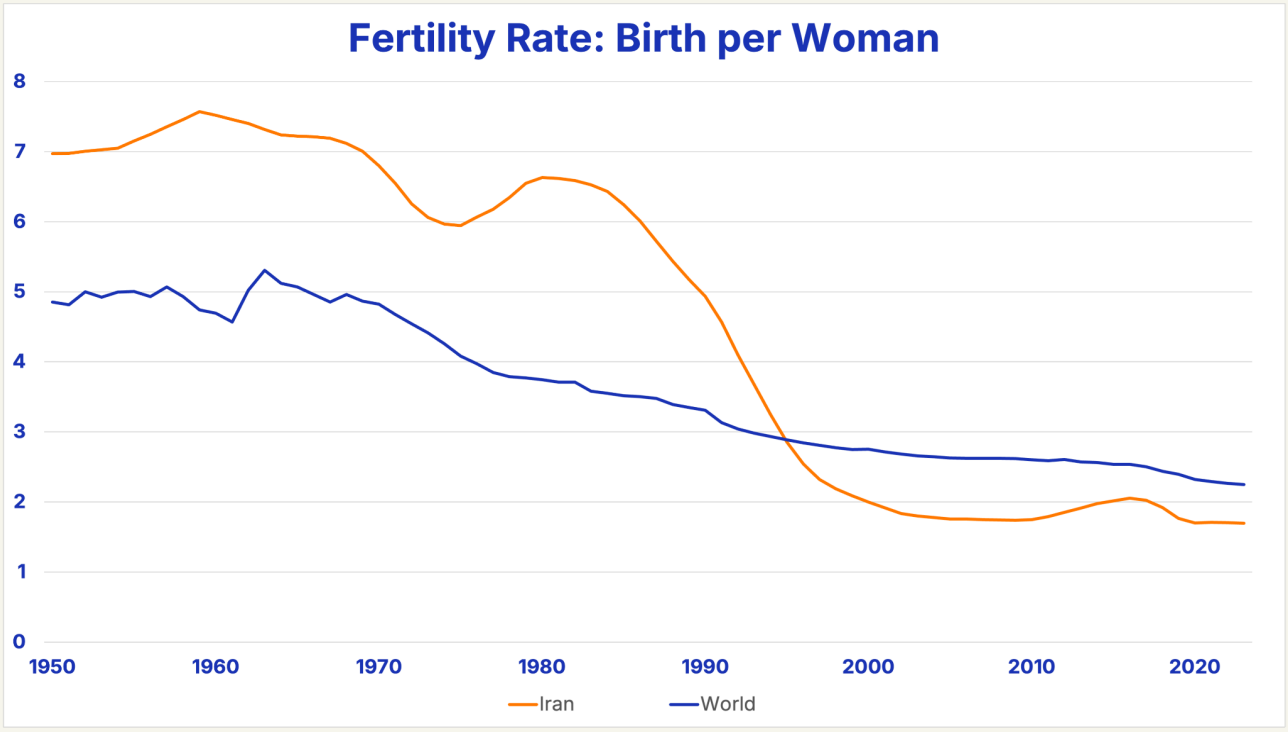


FIGURE 3: (Top) Life expectancy for Iranian men and women has reached 76 and 80, respectively. (Bottom) Iran has experienced one the sharpest drops in fertility in the world [1, 6]. Source: https://ourworldindata.org

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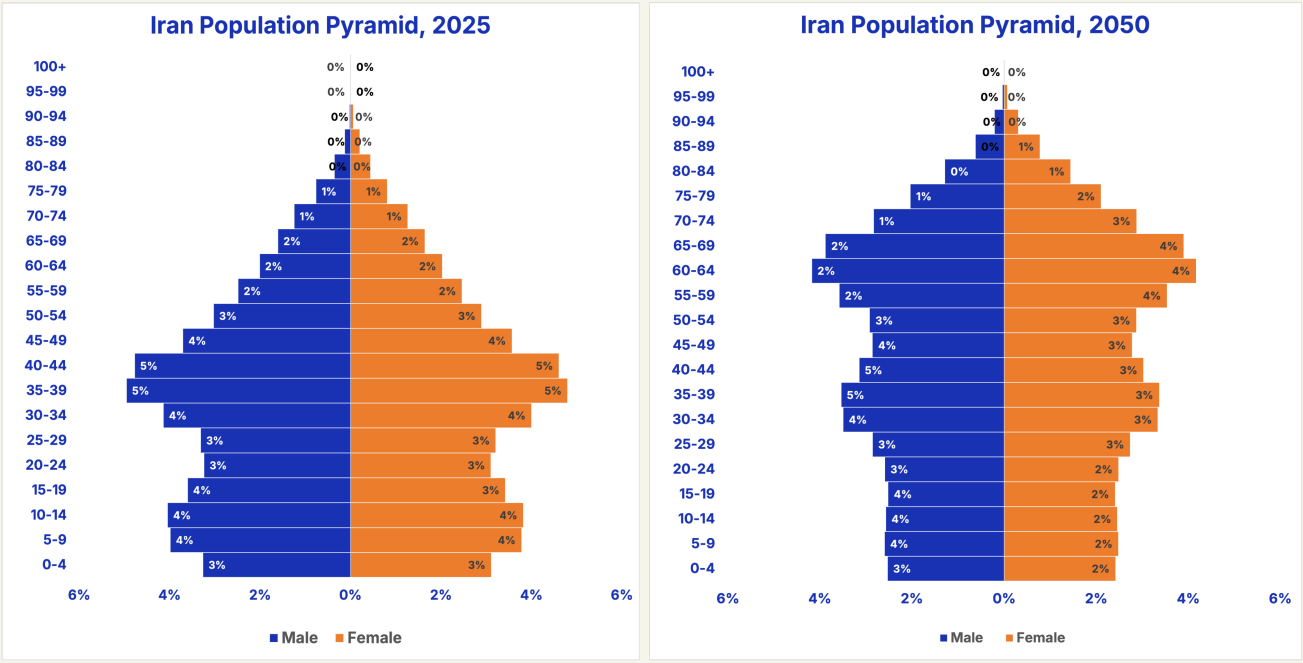

FIGURE 4: Iran's population pyramid in years 2025 & 2050
Source: https://ourworldindata.org

3. PENSIONS AROUND THE WORLD

3.1. Overview

Pension systems take many different forms around the world. Lindbeck and Persson [25] use a three-dimensional classification methodology (see Figure 5) based on the consequences of a pension system for redistribution and labor supply (captured by the actuarial fairness dimension), capital formation (captured by the degree of funding), and risk sharing (captured by the defined benefit vs. defined contribution dimension_not shown in Figure 5). In a defined-contribution (DC) system, the contribution rate is exogenous while the benefits are endogenous (i.e., determined by the level of contributions, the RoR on investments, etc.) [25]. In a defined-benefit (DB) system such as Iran's, however, the benefits are exogenous while the future contribution rates have to be endogenously adjusted for the pension budget to balance [25]. In a pure DC plan, risks are borne by the individual pensioner, whereas in a pure DB plan, they fall on the pension's sponsor (e.g., the employer or the government) [3]. Both DB and DC systems can be constructed in every corner of Figure 5, but systems along the II-IV line on the figure are easier to structure as DC [25].

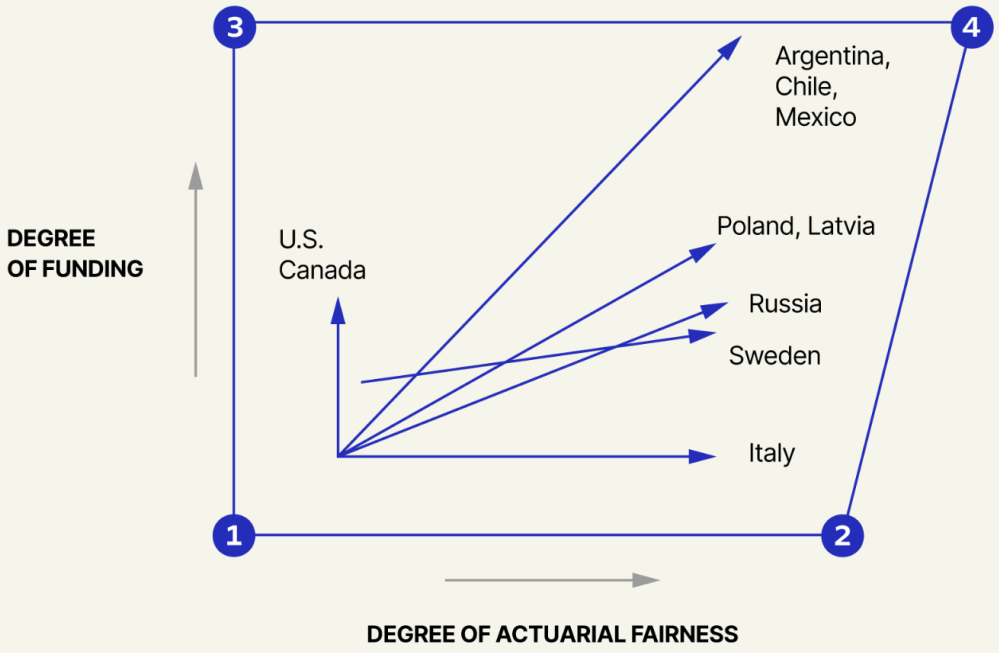

FIGURE 5: The evolution of pension systems around the world, adopted from Lindbeck & Persson (2003) [25]. Note that Argentina reversed course and re-nationalized its private pension funds in 2008 [3].

Actuarial fairness refers to the relation between benefits and contributions at the individual level [25]. A pension system is actuarially fair if the present value of any individual's expected pension payments is equal to the present value of their expected benefits [25]. The stronger the link between contributions and benefits in a pension system, the smaller the degree of redistribution and the labor-supply distortion that it creates [25]. If the link between contributions and benefits in a pension system is weak (or strong but complex and difficult to understand), workers will perceive their contributions as a "pure" tax, which will distort their labor supply and create a deadweight loss (DWL) [2]. The magnitude of the DWL will then be roughly proportional to the square of the marginal tax rate [26]. Iran's current pension system ranks very low on actuarial fairness due to its use of only two years of contributions in the benefit-calculation formula (see Section 3.1).

The final dimension is the degree of funding. In an unfunded or "pay-as-you-go" (PAYG) system such as Iran's, benefits to current pensioners are financed by a tax on current workers, while in a fully funded system, benefits are paid from previously accumulated funds [3, 25]. As Figure 3 shows, PAYG systems can be either completely non-actuarial (point I) or have strong actuarial properties (point II) [25]. The latter are sometimes called "quasi-actuarial" or "notional defined-contribution" (NDC) systems [3, 25]. In an NDC system, each individual has an account that grows with contributions and is converted into an annuity upon retirement. However, the

rate of return on those "accumulated" contributions is purely notional in the sense that it is set by the government to reflect what can be afforded, which makes it possible to operate them on a PAYG basis [3, 27]. The notional account balance is used purely for keeping track of a person's lifetime pension contributions, which have a quasi-actuarial relationship to his or her pension benefit [3]. An NDC system makes it easier for the workers to understand the relationship between their contributions and future benefits, which in turn reduces the DWL from payroll taxation [2, 25].

As Figure 5 shows, many countries around the world have implemented reforms to move their pension systems from DB-PAYG to FDC and increase their actuarial fairness [3, 5, 25]. These reforms have been motivated by the adverse labor-supply effects and growing fiscal imbalances of the old systems, which have been exacerbated by population aging (see also Section 4.2). In total, over 30 countries fully or partially replaced their PAYG systems with funded individual accounts from 1981 to 2004 [28]. Norway, Sweden, Italy, Poland, and Latvia have made NDC the core of their pension schemes [5, 27]. It should be noted, however, that most real-world pension systems are not 'pure' along any of the dimensions discussed above and often have multiple different components. Chile, for example, is one of the closest real-world examples to an actuarially fair FDC system [3]. However, it also has a flat, noncontributory, basic pension based on residence that is available to the poorest 90% of the population (up from 60% before 2022) [3, 5]. This basic pension is DB-PAYG and non-actuarial. Iran's pension system is mostly DB-PAYG but has a partial element of funding (see Section 3.3).

3.2. A Deeper Dive into PAYG vs. Funded

The traditional argument for PAYG systems relies on the concept of dynamic inefficiency. In his famous 1958 paper, Paul Samuelson used an overlapping generations model to show that a pure PAYG system financed with a payroll tax can provide pensioners with an "implicit" RoR on their contributions equal to the growth rate of the tax base [2, 29]. Under certain assumptions (a constant tax rate, a stable population pyramid, etc.), this growth rate is equal to the per capita rate of economic growth (g) plus the growth rate of the population (n) [5, 30], which is itself equal to the growth rate of the aggregate economy (i.e., $G = n + g$). Samuelson's paper showed that the introduction of a PAYG system in an economy with no durable goods or capital would raise the economic welfare of every generation, making it a Pareto improvement [29, 31]. Later, Aaron [30] showed that introducing a PAYG system in a dynamically inefficient economy (i.e., one with a capital intensity above the "golden rule" level [32], which implies $r < n + g$, with r being the marginal product of capital net of depreciation [31, 33]) would also raise the welfare of every generation because it would reduce the economy's excessively high steady-state capital stock [31, 34]. However, the empirical evidence suggests that major developed economies are all dynamically efficient [35], and the real RoR on capital far exceeds the rate of aggregate economic growth.[11] Under such conditions, the introduction of a PAYG system would benefit existing retirees but make all future generations worse off by reducing their consumption.[12] The key question in this case is therefore whether the gains to existing retirees are large enough to offset the losses to future generations (or vice versa if the move is from PAYG to funding). We will return to this question shortly.

It is important to note that Iran is almost certainly below its golden-rule level of capital stock due to a severe and persistent lack of foreign investment, under-developed domestic financial markets, and obstacles to domestic entrepreneurship. While the country may experience a period of very rapid economic growth (with $G > r$) after the fall of the Islamic Republic, such growth rates will not be sustainable once the country reaches its 'steady state' (as predicted by the Neoclassical Growth Model). Hence, in the long run, the only relevant question in Iran's case is whether the gains to future generations from a shift to a funded system will outweigh the losses to other groups during the transition.

[11] For example, the pre-tax real return to capital in the US from 1960 to 1994 averaged about 9.3%, while the growth rate of aggregate real wages over the same period was only 2.6% [31].

[12] One can also consider the case in which the golden-rule condition is satisfied exactly ($r = G$). Introducing a PAYG system in this scenario would also be a Pareto improvement since the existing retirees would gain without making the future generations worse off. See Table 1 in [25] for a summary.

Most plans for shifting from PAYG to FDC (including ours) envision that the government will honor its obligations to existing retirees, which means they won't be worse off as a result of the reform. However, as payroll contributions would now be diverted from the PAYG system into investment accounts, it is usually assumed the government will issue new debt to honor its obligations to existing retirees.[13] This new debt has to be paid by additional taxes on current (and potentially a few future generations of) employees (who are also contributing to their investment accounts), and those taxes can potentially make them worse off in the aggregate (and also shrink the overall economy due to DWL). Feldstein [31] showed that, as long as an economy grows, the conditions under which introducing a PAYG system would lower aggregate welfare (measured by the present value of the consumption of all generations) are the same as those under which a debt-financed transition from a PAYG to a funded system would raise aggregate welfare, namely, that r is greater than both G and the appropriate discount rate for the consumption of future generations. Since these conditions generally hold [31], the shift from PAYG to funding would increase the present value of consumption aggregated across all generations [31].[14]

The case for reform is even stronger in Iran given that the constraints noted above do not necessarily apply to it. Iran is a country with vast oil reserves that can be extracted at a cost considerably below the global price (kept artificially high by OPEC). Therefore, its government can raise substantial amounts of revenue without resorting to distortionary taxation. However, a large portion of those resource rents currently support the Islamic Republic's foreign adventurism and corruption rather than benefiting the Iranian people. Once those wasteful expenditures are eliminated, and the government's revenue from natural resources increases even beyond its current level due to the inflow of foreign investment, it will be feasible to honor the government's obligations to existing pensioners without raising the tax rates on current and future workers (see Section 6.2 for more details).

Another argument advanced in favor of shifting from PAYG to FDC is that it could increase a country's future GDP by increasing its savings rate and capital stock [25, 36]; however, the debate over whether this would actually happen or not is still not settled [37–38]. We will not devote additional space to this question since we find it less relevant to Iran's future. From an optimal diversification angle, it is advisable for future pensioners to allocate the majority of their MIRA funds to international financial assets [39]. Hence, even if the savings rate does go up, only a fraction of those additional savings would end up invested in Iran's economy. We will explore additional arguments for moving from PAYG to FDC at the end of Section 5.

4. DESIGNING THE IDEAL PENSION SYSTEM FOR IRAN

For the reasons discussed in Sections 3 and 4, we propose a total and phase-by-phase replacement of the present system in Iran with an FDC model that will be paired with certain poverty relief measures for the elderly. The workers' retirement contributions will be held in mandatory individual retirement accounts (MIRAs) and invested in low-cost index funds holding a wide range of highly diversified international financial assets. Reputable international asset managers such as Vanguard, Blackrock, and others could be tasked with managing those investments, and account holders will have the option of choosing among a limited number of competing funds that meet strict investor-protection standards. Individuals will have the option of fully or partially annuitizing their savings upon retirement to protect themselves against longevity risk and receive a steady stream of income. Contributions to MIRAs and post-retirement withdrawals from them will be tax free, but early withdrawals will be subject to taxes and/or penalties. The default contribution rates we currently envision are 5% by the employer, 5% by the employee, and a government match equal to 2% of the national median wage (paid conditional on employee participation). The employee's share will be the same as the rate currently paid to the SSO, which would make the transition more politically palatable, while the employer's share will be substantially lower than its current level to boost job creation. Finally, the government's share will be similar to the SSO but with a distinction: The contribution amount is flat rather than proportional to an individual's wage, since a system that subsidizes high earners more heavily is difficult to justify on fairness grounds.

[13] This essentially amounts to converting the implicit government debt embodied in the PAYG system to explicit debt.
[14] For comparison, this would raise the welfare of future generations by an amount equivalent to 5% of the GDP in the United States [2].

The combined contribution rate of 12% is also used by the Superannuation Guarantee (or "Super" for short) in Australia[15] [40–41] but a little higher than the 10% used in Chile [5], which may have been too low given Chile's specific circumstances [3]. Among other countries that combine an FDC system with a basic or targeted anti-poverty scheme, Denmark, Israel, Iceland, Mexico, and the UK have total FDC contribution rates of 12.0%, 12.5%, 15.5%, 15.0%, and 8.0% for new workers [5]. For illustration, a person who starts working at 22, retires at 65, and invests 12% of his salary every year with a fairly conservative real RoR of 5% per year [3] will be able to get a replacement rate of almost 70% during retirement [42]. RoRs that are more in line with historical experience (7% or higher [43]) will result in replacement rates above 100%. We find it notable that the Australian system was implemented by a Labor government and had strong backing from the country's unions.

The flat government contribution in our proposal will especially help workers whose lifetime earnings alone are not high enough to secure a poverty-free retirement. If government MIRA contributions over an individual's working life are ultimately insufficient to push their pension income/assets above the poverty line, additional aid will be provided from general government revenues to those pensioners who contributed to MIRAs and/or the legacy pension system for a minimum number of years. However, retirees who did not contribute to the FDC system for a minimum of 30 years [12] will not be eligible for such relief.[16]

As far as individuals' choices over their portfolios and fund providers are concerned, it is important to remember that most of them are unfamiliar with the principles of investing and are subject to various behavioral biases including myopia, inertia, and choice paralysis [3, 40]. Certain lessons can be drawn from behavioral economics and the experience of other countries with pension reform to help individuals make more optimal choices with their retirement funds [3, 40]:

- Use *auto-enrollment* to counter myopia and procrastination.
- Keep choices simple (for example, by limiting the number of funds and providing clear investor guidance) to counter *choice paralysis* (i.e., individuals making no choice in the face of complexity).
- Design a good default option and use *auto-investment* to onboard individuals who still fail to make a timely choice.
- Use *auto-annuitization* upon retirement to protect pensioners against longevity and market risk. The default auto-annuitization setting could be only partial, designed to guarantee a minimum standard of living. Auto-annuitization can also alleviate the problem of adverse selection that can potentially arise in annuity markets.

A further argument for a move away from PAYG that is especially relevant in Iran's case is one based on the political incentive structure, or public choice theory [45]. There are three actors in this framework: First, the pensioners whose interest is to increase their pension payments as much as they can. Second are the younger working people, who are not as politically engaged with the topic of pensions or public debt because they are not immediately affected by them. And finally, there are the politicians who get elected by appealing to the most politically engaged voters and do not pay a price for saddling the pension system with unfunded liabilities if they can "kick the can down the road" and make it the responsibility of future politicians to deal with. Therefore, as long as the pension system is PAYG and remains within the government's purview, politics will overrule good governance. The result is a pension system that is bound to accumulate unfunded liabilities and increase public debt [45]. Other arguments in favor of a funded model are that: (a) it boosts fertility [46], which can slow down Iran's population aging; (b) it creates an "ownership society" [47] by turning the entire population into shareholders,[17] which will make them more tolerant of the private ownership and profitability of the firms [25]; and (c) it increases a

[15] Contributions to *Super* are subject to a 15% tax, which means that the real contribution rate is closer to 10% [40]. However, when thinking about adequacy, it should be noted that about 80% of Australian retirees also qualify for the country's public *age pension*, which is affluence-tested and financed from general revenues [40]. Earnings in a *Super* account during the accumulation phase are also taxed at 15%, but withdrawals after a certain age are tax free [44]. The *combined* net replacement rates from *Super* and the age pension are 68% for the average worker and 101% for low-paid workers [40].
[16] This requirement will not apply to current retirees and people close to retirement since they did not have access to MIRAs during their working years.
[17] Relatedly, pension reform has been found to be a key driver of declining wealth inequality in Denmark [48].

country's savings rate and capital stock. While all of these arguments are valid, the last two are less relevant to our proposal since most of the funds held in Iranian MIRAs will be invested internationally rather than domestically (see also Section 4.2).[18]

A common argument against shifting from DB-PAYG to FDC is that it will subject workers to the risk of their investments underperforming during their lifetimes. However, it is crucial to remember that PAYG systems also subject workers to a variety of risks, including the "political risk" that a future government may alter the rules and not honor its obligations to the pensioners, in addition to the risk that future economic growth may turn out to be lower than expected, whether because of wage and/or population stagnation [25, 31]. A more sophisticated argument in favor of a mixed (rather than pure PAYG) system is that PAYG pensions introduce a new type of "asset" (with an RoR equal to G) that is not perfectly correlated with equity markets [25, 51]. It follows that a mixed system can theoretically improve the risk-return trade-off available to a future pensioner through diversification [25, 51]. However, the fact that the amount of PAYG assets to hold is mandated by the government means that this choice may not be optimal from the individual's perspective [25]. While our proposed model is not explicitly PAYG, it nevertheless incorporates some degree of diversification along this dimension as two of its components are likely to be correlated with G: the 2% government contribution that is indexed to the national median wage rather than individual wages, and the old-age poverty-relief component (since a more affluent society will likely use a higher income threshold for defining poverty).

5. THE TRANSITION PROCESS

5.1. Phase I

The government's main objectives during the initial transition phase (~5 years) will be to support the existing pensioners with minimal disruption[19] and prepare the infrastructure for the eventual launch of the FDC system, while also implementing several parametric and institutional reforms. It is important to acknowledge that both the process of contracting with global asset managers and the process of raising additional government revenue to support the existing pensioners and compensate the transition generations (whether from the privatization of state-owned assets or from increased hydrocarbon production through the attraction of foreign investment) will take at least a few years, which means there is little utility in switching to individual accounts immediately. To reduce the pension system's unfunded liabilities and increase labor supply and economic growth in the critical post-Islamic Republic period, the statutory retirement age for both men and women will be raised to 67 by the end of this phase and indexed to further increases in life expectancy [5, 12].[20] In addition, the benefit calculation window will be incrementally increased to 10 years by the end of this period to mitigate the problem of wage under-declaration (see Section 3.1 for more details).

The government will also adopt a number of institutional reforms to improve the management and fiscal standing of the pension funds, including the following recommendations from the World Bank [12]:

- The SSO should not be mandated to support the government's national development goals and other initiatives such as infrastructure projects and export diversification;
- Pension funds should not act as lenders of last resort to the government;
- The practice of accepting public companies in lieu of payments on government debt must be stopped;
- The High Council for Social Security will be reinstated (see Section 3.2);

[18] Indeed, one reason behind the lower-than-expected returns of the Chilean pension funds may have been the strict limits placed on the amount of foreign assets they were allowed to hold by the Chilean government [3, 49–50].

[19] The total cost is currently about 7% of the GDP [8].

[20] While the current OECD average is closer to 65, many countries (including Finland, Greece, the Netherlands, Portugal, and Sweden) have linked their pension ages to increases in life expectancy [5]. If current trends continue, life expectancy in Iran will rise by another two years or so by the end of phase I.

- Board members will be required to possess the relevant expertise and follow their fiduciary obligations to plan beneficiaries;
- External audits will be conducted on a regular basis, and the central bank will act as the independent custodian of the funds.

5.2. Phase II

At the end of phase I, people younger than 50 will have their retirement contributions adjusted and redirected into their MIRAs. They will also be compensated, on an inflation-adjusted basis, for their lifetime contributions to the legacy system (including both the employee and employer contributions but excluding the government contribution) with proceeds from the sale of (non-healthcare) SSO assets supplemented by funds from additional privatizations.[21] Lump-sum compensation payments from the government will be directly deposited into MIRAs. While those payments may have a lower value than legacy benefits individuals were expecting, this will be offset by the superior returns now available to them in the equity markets.[22]

Working people at or above age 50 will remain in the legacy DB system and collect their pensions accordingly.[23] In return, they will make ongoing contributions to support the population of existing retirees. However, a few parametric changes will be made to their benefit formula to lower the cost of supporting them to the government as the flow of new contributions into the DB system shrinks and eventually stops. These changes will include the gradual reduction of the accrual rate to 2% and a further expansion of the benefit calculation period to 20 years as recommended by the IMF [22]. Chile devoted about 4% of its GDP to paying legacy obligations in the early years of the reform [3, 39]. While the number may seem large, it compares favorably to the 9% of GDP that OECD governments are currently spending on pensions on average, or the 10.4% that they will be spending by 2060 [52]. Based on IMF's calculations, total pension spending by the two largest funds in Iran (SSO and CSPF) will hit 11% of the GDP by 2040 and 15% by 2050 if no reforms are implemented [8]. IMF's estimates also show that the adoption of the two parametric reforms mentioned above along with raising the retirement age to 65 (which is less drastic than our proposal) will reduce the annual pension deficit by about 7% of the GDP from 2040 to 2050 [22]. Although producing exact estimates will require detailed simulations that are beyond the scope of this paper, implementing the parametric reforms we propose coupled with closing the DB system to new entrants will likely limit the annual cost of legacy DB obligations to 10% of the GDP or less for the rest of this century. By comparison, oil rents alone have generally exceeded 20% of Iran's GDP in sanction-free years [53]. To conclude, Iran is blessed with a wealth of natural resources that could support its transition to a sustainable pension system with minimal reliance on distortionary taxation.

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[21] See the chapter on privatization for more details. One estimate puts the total value of the assets owned by the SSO at 600 trillion rials (or about $750M) [11].
[22] Assuming normal equity-market returns (~ 7% per year), even individuals aged 49 will have a chance to nearly *triple* the value of their lump-sum reimbursement by the time they retire.
[23] Assuming current trends in life expectancy continue, the last cohort in this group will enter retirement around 2050.

REFERENCES

1. Mehri, N., Messkoub, M., & Kunkel, S. (2020). Trends, determinants and the implications of population aging in Iran. Ageing International, 45(4), 327-343.
2. Feldstein, M., & Samwick, A. (1998). The transition path in privatizing social security. In Privatizing social security (pp. 215-264). University of Chicago Press.
3. Barr, N., & Diamond, P. (2009). Pension reform: A short guide. Oxford University Press.
4. https://compareyourcountry.org/pensions/en/0/431/default
5. OECD (2023), Pensions at a Glance 2023: OECD and G20 Indicators, OECD Publishing, Paris, https://doi.org/10.1787/678055dd-en.
6. جوادی, شاهین و ایزدبخش, حمیدرضا . (1403). سلسله گزارش های تحلیل و شبیه سازی سیستمی (1): راهکارهای ارتقای پایداری صندوق های بازنشستگی. (20073). ماهنامه (گزارش های کارشناسی مرکز پژوهش های مجلس شورای اسلامی, 32(7), https://report.mrc.ir/article_10402.html
7. Gomari, H., Mirzaebrahimi, R., & Bazrafkan, F. (2020). A glimpse at Iran's pension funds,

https://cspf.ir/Content/media/image/2024/09/1938_orig.pdf,
https://saba-psi.ir/wp-content/uploads/2020/01/62.pdf (Farsi).

8. مالکی, محمدرضا , فروزان فر, محمد مهدی و حسینعلی زاده, رامین . (1402). ناپایداری صندوق های بازنشستگی (۲) : سلسله گزارش های پویایی شناسی چالش های کشور. ماهنامه گزارش های کارشناسی مرکز پژوهش های مجلس شورای اسلامی, 31(8), (19283)), https://report.mrc.ir/article_9829.html
9. قاسمی سیانی, مهدی . (1402). بررسی لایحه برنامه هفتم توسعه (۱۳): موضوعات راهبردی بخش عمومی (صندوق های بازنشستگی). (19057). ماهنامه گزارش های کارشناسی مرکز پژوهش های مجلس شورای اسلامی, 31(4), 19057, https://report.mrc.ir/article_9556.html
10. https://www.issa.int/node/195543?country=879
11. اخوان بهبهانی, علی . (1396). بررسی وضعیت سازمان تأمین اجتماعی و ضرورت اصلاحات بنیادی در آن (علل و اقدامات فوری مورد نیاز). ماهنامه گزارش های کارشناسی (مرکز پژوهش های مجلس شورای اسلامی, 25(8), -. https://report.mrc.ir/article_6976.html
12. World Bank. (2003). The Pension System in Iran: Challenges and Opportunities, Volume 1. Main Report. https://openknowledge.worldbank.org/entities/publication/30ecf5ef-6509-55e7-8e5b-1e6e027fdd09
13. https://www.isna.ir/news/1401122518095/%D9%87%D9%85%D9%87-%DA%86%DB%8C%D8%B2-%D8%AF%D8%B1%D8%A8%D8%A7%D8%B1%D9%87-%D8%A8%D8%B1%D9%82%D8%B1%D8%A7%D8%B1%DB%8C-%D8%AD%D9%82%D9%88%D9%82-%D8%A8%D8%A7%D8%B2%D9%86%D8%B4%D8%B3%D8%AA%DA%AF%DB%8C-%D8%A7%D8%B2-%D8%B3%D9%86-%D9%88-%D8%B3%D8%A7%D8%A8%D9%82%D9%87-%D8%AA%D8%A7-%D8%AF%D8%B3%D8%AA%D9%85%D8%B2%D8%AF
14. Sadati, S. M., Khandan, A., & Hadadmoghadam, M. (2024). Pension policies and early retirement: New evidence from a counterfactual analysis in Iran. The Economic and Labour Relations Review, 35(1), 45-65.
15. قاسمی سیانی, مهدی . (1402). بررسی ابعاد مصوبه افزایش سن بازنشستگی در برنامه هفتم توسعه. (19545). ماهنامه گزارش های کارشناسی مرکز پژوهش های مجلس شورای اسلامی, 31(10), https://report.mrc.ir/article_9947.html
16. https://www.iranintl.com/en/202401145085
17. https://resalat-news.com/%D9%88%D8%B6%D8%B9%DB%8C%D8%AA-%D8%B3%D8%A7%D9%84%D9%85%D9%86%D8%AF%DB%8C-%D8%AF%D8%B1-%D8%A7%DB%8C%D8%B1%D8%A7%D9%86%D9%90-%D8%A2%DB%8C%D9%86%D8%AF%D9%87-%D9%88-%DA%86%D8%A7%D9%84%D8%B4

18. https://snn.ir/fa/news/1067706/%D9%85%DB%8C%D8%B2%DA%AF%D8%B1%D8%AF-%D8%AA%D8%AE%D8%B5%D8%B5%DB%8C-%D8%A7%D8%A8%D8%B1-%D8%A8%D8%AD%D8%B1%D8%A7%D9%86-%D8%B5%D9%86%D8%AF%D9%88%D9%82%E2%80%8C%D9%87%D8%A7%DB%8C-%D8%A8%D8%A7%D8%B2%D9%86%D8%B4%D8%B3%D8%AA%DA%AF%DB%8C-%D8%AF%D8%B1-%D8%AF%D8%A7%D9%86%D8%B4%DA%AF%D8%A7%D9%87-%D8%B9%D9%84%D8%A7%D9%85%D9%87-%D8%B7%D8%A8%D8%A7%D8%B7%D8%A8%D8%A7%DB%8C%DB%8C

19. Khorshidi, M., & Mirebeigi, V. (2023). Influential Factors in the construction of Retirement Fund Crises in Iran from Stakeholders' Perspective (With a Focus on the Social Security Organization). Journal of Social Problems of Iran, 14(1), 203-232.

20. https://www.ilna.ir/%D8%A8%D8%AE%D8%B4-%DA%A9%D8%A7%D8%B1%DA%AF%D8%B1%DB%8C-9/982525-%D8%B3%D8%AA%DB%8C%D8%B2-%D8%B3%DB%8C%D8%A7%D8%B3%DB%8C%D9%88%D9%86-%D8%A8%D8%A7-%D8%A7%D8%AD%DB%8C%D8%A7%DB%8C-%D8%B4%D9%88%D8%B1%D8%A7%DB%8C-%D8%B9%D8%A7%D9%84%DB%8C-%D8%AA%D8%A7%D9%85%DB%8C%D9%86-%D8%A7%D8%AC%D8%AA%D9%85%D8%A7%D8%B9%DB%8C-%D8%AA%D8%A7%D8%AE%D8%AA-%D8%AA%D8%A7%D8%B2-%D8%A8%D9%87-%D8%A7%D8%B3%D8%A7%D8%B3%D9%86%D8%A7%D9%85%D9%87-%D9%82%D8%AF%DB%8C%D9%85%DB%8C-%D8%AA%D8%B1%DB%8C%D9%86-%D8%B3%D8%A7%D8%B2%D9%85%D8%A7%D9%86-%D8%A8%DB%8C%D9%85%D9%87-%D8%A7%DB%8C-%D8%B4%D8%B1%DA%A9%D8%A7%DB%8C-%D8%A7%D8%AC%D8%AA%D9%85%D8%A7%D8%B9%DB%8C-%DA%A9%D8%AC%D8%A7-%D8%A7%DB%8C%D8%B3%D8%AA%D8%A7%D8%AF%D9%87-%D8%A7%D9%86%D8%AF

21. https://bimeh.com/mag/social-security-organization/

22. https://www.imf.org/en/Publications/CR/Issues/2018/03/29/Islamic-Republic-of-Iran-2018-Article-IV-Consultation-Press-Release-Staff-Report-and-45767

23. https://www.irna.ir/news/85289096/%D8%A2%DB%8C%D8%A7-%D9%BE%DB%8C%D8%B1%DB%8C-%D8%AC%D9%85%D8%B9%DB%8C%D8%AA-%D9%85%D8%B5%D8%A7%D8%B1%D9%81-%D8%B5%D9%86%D8%AF%D9%88%D9%82-%D9%87%D8%A7%DB%8C-%D8%A8%D8%A7%D8%B2%D9%86%D8%B4%D8%B3%D8%AA%DA%AF%DB%8C-%D8%B1%D8%A7-%D8%A7%D9%81%D8%B2%D8%A7%DB%8C%D8%B4-%D9%85%DB%8C-%D8%AF%D9%87%D8%AF

24. بهداروند, شاهین . (1403). بررسی بخش دوم لایحه بودجه سال 1403 (6): (بخش صندوق های بازنشستگی). (19717). ماهنامه گزارش های کارشناسی مرکز پژوهش های مجلس شورای اسلامی, 32(2), https://report.mrc.ir/article_10138.html

25. Lindbeck, A., & Persson, M. (2003). The gains from pension reform. Journal of economic Literature, 41(1), 74-112.

26. Feldstein, M. (2005). Structural reform of social security. Journal of economic perspectives, 19(2), 33-55.

27. Hinrichs, K. (2021). Recent pension reforms in Europe: More challenges, new directions. An overview. Social policy & administration, 55(3), 409-422.

28. Orenstein, M. A. (2013). Pension privatization: Evolution of a paradigm. Governance, 26(2), 259-281.

29. Samuelson, P. A. (1958). An exact consumption-loan model of interest with or without the social contrivance of money. Journal of political economy, 66(6), 467-482.

30. Aaron, H. (1966). The social insurance paradox. Canadian Journal of Economics and Political Science, 32(3), 371-374.

31. Feldstein, M. S. (1995). Would privatizing social security raise economic welfare?

32. Phelps, E. (1961). The golden rule of accumulation: a fable for growthmen. The American Economic Review, 51(4), 638-643.

33. Phelps, E. S. (1965). Second essay on the golden rule of accumulation. The American Economic Review, 55(4), 793-814.

34. Peter, D. (1965). National debt in a neoclassical growth model. American economic review, 55(5), 1126-1150.

35. Abel, A. B., Mankiw, N. G., Summers, L. H., & Zeckhauser, R. J. (1989). Assessing dynamic efficiency: Theory and evidence. The Review of Economic Studies, 56(1), 1-19.

36. Kotlikoff, L. J. (1996). Privatization of social security: how it works and why it matters. Tax policy and the economy, 10, 1-32.

37. Barro, R. J., & Feldstein, M. (1978). The impact of social security on private saving: Evidence from the US time series. https://www.aei.org/research-products/book/the-impact-of-social-security-on-private-saving-evidence-from-the-u-s-time-series/

38. Andrews, E. S. (2006). Pension reform and the development of pension systems: An evaluation of World Bank assistance. World Bank Publications.

39. Kotlikoff, L. J. (1994). Rethinking the World Bank's social insurance analysis. Education and Social Policy Department, Human Resources Development and Operations Policy, World Bank.

40. Chomik, R., & Piggott, J. (2016). The Australian Retirement Income System: Comparisons with and Lessons for the United States. Reimagining Pensions: The Next 40 Years, 274.

41. https://www.ato.gov.au/tax-rates-and-codes/key-superannuation-rates-and-thresholds/super-guarantee

42. https://investor.vanguard.com/tools-calculators/retirement-income-calculator

43. https://www.visualcapitalist.com/90-years-stock-and-bond-portfolio-performance/

44. https://www.ato.gov.au/individuals-and-families/super-for-individuals-and-families/super/withdrawing-and-using-your-super/early-access-to-super/tax-on-super-benefits

45. Buchanan, J. M., & Wagner, R. E. (1977). Democracy in deficit: The political legacy of Lord Keynes. (No Title).

46. Boldrin, M., De Nardi, M., & Jones, L. E. (2015). Fertility and social security. Journal of Demographic Economics, 81(3), 261-299.

47. https://georgewbush-whitehouse.archives.gov/news/releases/2004/08/20040809-9.html

48. Andersen, T. M., Bhattacharya, J., Grodecka-Messi, A., & Mann, K. (2024). Pension reform and wealth inequality: Theory and evidence. European Economic Review, 165, 104746.

49. Diamond, P. A., & Valdés, S. (1993). Social security reforms in Chile.

50. https://www.spensiones.cl/portal/institucional/594/articles-3523_chapter4.pdf

51. Dutta, J., Kapur, S., & Orszag, J. M. (2000). A portfolio approach to the optimal funding of pensions. Economics Letters, 69(2), 201-206.

52. https://www.superannuation.asn.au/wp-content/uploads/2023/09/230201_ASFA_Research_Note_Cost_of_Pension_Systems_final.pdf

53. https://data.worldbank.org/indicator/NY.GDP.PETR.RT.ZS?locations=IR

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